

$$\textcircled{32} \quad f(2) = -36$$

$$3, 1, -1-3i, -1+3i$$

$$f(x) = a(x-3)(x-1)(x+1+3i)(x+1-3i) \quad \begin{matrix} (x+2)(x+3) \\ x^2+5x+6 \end{matrix}$$

$$f(x) = a(x-3)(x-1)(x^2+2x+10)$$

$$-36 = a(2-3)(2-1)[2^2+2(2)+10] \quad \begin{matrix} 5x^2+25x+30 \\ 5(x^2+5x+6) \end{matrix}$$

$$-36 = -18a$$

$$2 = a$$

$$f(x) = 2(x-3)(x-1)(x^2+2x+10)$$

$$\begin{matrix} 5(x+2)(x+3) \\ a \end{matrix}$$

(36)  $f(x) = x^4 - 3x^3 - 8x^2 + 22x - 24$

$1-i$  is a zero  
 $1+i$

$$f(x) = (x - 1 + i)(x - 1 - i)(\quad)(\quad)$$

$\pm 1 \quad \pm 2 \quad \pm 3 \quad \pm 4 \quad \pm 6 \quad \pm 8, \pm 12, \pm 24$

②  $f(x) = 3x^3 - 8x^2 + x + 2$   $[-1, 0]$

$$\begin{array}{r|rrrr} & 3 & -8 & 1 & 2 \\ -1 & 3 & -11 & 12 & -10 \\ 0 & & & & 2 \end{array}$$

> Intermediate Value theorem says there must be root